

What is Claimed is:

1. A closure system for a fluid outlet, the system comprising:
a motor connected to a threaded shaft that passes through and is enmeshed with a threaded hole of a hub,
5 the threaded hole extending through the hub to a recess disposed within the hub, the hub being connected to a closure for covering the fluid outlet, the hub also comprising an abutment,
the hub further comprising a curved slot coaxial with the threaded hole and spaced radially outwardly therefrom, the curved slot terminating at two
10 circumferentially spaced apart ends,
the curved slot accommodating a stationary pin that permits a partial rotation of the hub about an axis through the threaded hole,
the shaft being connected to a biasing member that engages the stationary pin and the hub and which biases the hub towards a position where the stationary pin
15 engages one of the ends of the curved slot with the closure covering the fluid outlet, the threaded shaft also being connected to a radially outwardly extending finger,
the motor rotating the shaft within the threaded hole of the hub resulting in axial movement of the hub and closure away from the motor and fluid outlet respectively and rotating the finger towards the abutment and, when the finger
20 engages the abutment, continued rotation of the shaft overcomes the bias of the biasing member resulting in partial rotation of the hub and closure to a position where the stationary pin engages the other of the ends of the curved slot with the closure being rotated away from the fluid outlet.
- 25 2. The closure system of claim 1 wherein the abutment comprises a second pin connected to the hub, and wherein the second pin is disposed within the recess of the hub.
- 30 3. The closure system of claim 1 wherein the motor is a two-way motor and reverse action of the motor results in biasing movement of the hub axially along the shaft back to the position where the closure covers the fluid outlet.

4. The closure system of claim 1 wherein the motor is a two way motor and a reverse rotation of the motor and the threaded shaft moves the hub axially back towards the fluid outlet after the bias of the biasing member rotates the hub and closure back into alignment with the fluid outlet.

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5. The closure system of claim 1 wherein the biasing member is a spring.

6. The closure system of claim 1 wherein the biasing member is a torsional spring having a body wrapped around the shaft and two radially outwardly extending legs, one leg engaging the stationary pin, the other leg being received in a slot disposed in an inside wall of the hub that defines the recess where the biasing member and finger are also located.

7. The closure system of claim 1 further comprising at least on light emitting device for aligning a container beneath the fluid outlet.

8. The closure system of claim 1 wherein hub is cylindrical with and a flat first end with the curved slot extending from the recess of the hub through the first end,
the motor being connected to a mounting plate disposed between first end of the hub and motor,
the stationary pin being connected to the mounting plate.

9. The closure system of claim 1 wherein the closure is a polymeric cup for providing a seal around the fluid outlet.

10. The closure system of claim 1 wherein the motor is supported on top of a support plate having holes for accommodating the threaded shaft and fluid outlet, the support plate comprising an underside that is connected to a cover. The cover enclosing the hub and closure element and further comprising a hole for the passage of fluid from the fluid outlet.

11. A closure system for a fluid outlet, the system comprising:

a motor connected to a proximal end of a lead screw also having a distal end with a threaded portion disposed therebetween, the distal end of the lead screw connected a radially outwardly extending finger,

5 the lead screw passing through a threaded hole of a hub having a first end and a second end, the threaded hole extending from the first end that faces the motor to a recess within the hub, the distal end of the lead screw and the finger being disposed within the recess, the hub further comprising an abutment disposed within the recess,

10 the second end of the hub connected to a proximal end of an arm extending radially outwardly from the hub, a distal end the arm being connected to a closure for covering the fluid outlet,

the hub comprising a curved slot coaxial with the threaded hole and spaced radially outwardly therefrom, the curved slot terminating at two circumferentially spaced apart ends,

15 the curved slot accommodating a stationary pin that permits a partial rotation of the hub about an axis defined by the threaded hole,

the distal end of the lead screw engaging a spring that engages the stationary pin and the hub and which biases the hub towards a position where the stationary pin engages one of the ends of the curved slot with the closure covering the fluid outlet,

20 the motor rotating the lead screw resulting in axial movement of the hub, arm and closure away from the motor and fluid outlet respectively and rotation of the lead screw further rotating the finger within a recess and towards the abutment and, when the finger engages the abutment, continued rotation of the lead screw overcomes the bias of the spring resulting in partial rotation of the hub, arm and closure to a position

25 where the stationary pin engages the other of the ends of the curved slot with the closure being rotated away from the fluid outlet.

12. The closure system of claim 11 wherein the abutment comprises a pin connected to the hub.

13. The closure system of claim 11 wherein the motor is a two way motor with a reverse rotation that moves the hub arm and closure axially towards the fluid outlet after the spring rotates the hub, arm and closure back to a position in alignment with the fluid outlet.

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14. The closure system of claim 11 wherein the distal end of the lead screw is connected to a retainer and the spring is disposed between the retainer and the threaded portion of the lead screw.

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15. The closure system of claim 11 wherein the spring comprises a body wrapped around the distal end of the lead screw and two radially outwardly extending legs, one leg engaging the stationary pin, the other leg being received in a slot disposed in an inside wall of the hub that defines the recess where the biasing member and finger are located.

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16. The closure system of claim 11 wherein an underside of the arm further comprises at least light emitting device for aligning a container beneath the fluid outlet.

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17. The closure system of claim 11 wherein hub is cylindrical with and the first end being flat with the curved slot extending from the recess of the hub through the first end, the stationary pin being connected to the motor.

25 18. The closure system of claim 11 wherein hub is cylindrical with and the first end being flat with the curved slot extending from the recess of the hub through the first end,

the motor being connected to a mounting plate disposed between the hub and motor,

the stationary pin being connected to the mounting plate.

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19. The closure system of claim 11 wherein the closure is a cup that provides a seal around the fluid outlet.

20. The closure system of claim 11 wherein the motor is supported on top of a support plate having holes for accommodating the threaded shaft and fluid outlet, the support plate comprising an underside that is connected to a cover. The cover enclosing the hub and closure element and further comprising a hole for the passage
5 of fluid from the fluid outlet.

21. A method for dispensing fluid comprising:
providing a closure element below a nozzle wherein the closure element provides a sealing cover below the nozzle to protect the nozzle and fluid contained
10 therein from ambient atmosphere;
moving the closure element vertically downward;
pivoting the closure element about an axis generally parallel to the nozzle so that the closure element moves about an arc away from an area directly beneath the nozzle;
15 dispensing fluid from the nozzle;
pivoting the closure element back the area beneath the nozzle; and
raising the closure element vertically to provide said seal and cover for the nozzle.

20 22. The method of claim 21 wherein the pivoting of the closure element back to the area beneath the nozzle is performed by a spring.